

PANTIES USAGE: FEEL COMFORTABLE OR SEXY?

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Abstract

This study aimed to investigate women's motivations for panties usage. By means of a survey with 348 women, comfort perception versus appearance evaluation were analyzed, through an behavioral approach. The analysis involved a clustering of primary data and crosstables among clusters. K-Means Cluster Analysis and Pearson's Chi-square Tests by Crosstables were applied. Results indicated that daring women tend to be extroverted and value psychological comfort; conservative women tend to be introverted and value psychological comfort; moderate women tend to be contextual in usage and does not prioritize any comfort dimension.

Key-words: Comfort perception; appearance evaluation; behavioral profiles; panties usage.

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1 introduction

The use of panties is strongly related to women personality. Women have panties preference based upon esthetic or functional expectations. Some women have trouble in finding comfortable panties when they want to feel sexy and fashionable. Otherwise, some women feel constrained when using sexy panties and prefer to use panties that hide undesirable parts of the body, or that make her feel secure. Inappropriate panties design may lead to discomfort and may lost the preference of consumers, while the proper design of panties, combining a desirable look with characteristics to improve comfort perception could enchant consumers. So, understanding the preferences of women is essential to improve panties design.

How to get a good fit in apparel is a huge concern for many researchers in the aim to ensure user comfort and better appearance, since there are many studies about that (Fan et al, 2004; Fan et al, 2007; Grogan et al, 2013; Labat and Delong, 1990; Paff Ogle et al, 2014; Vinué et al, 2014; Yu, 2011). Otherwise, some authors analyzes the satisfaction with clothes from the emotional perspective, mainly related to body image, social aspects, and self-realization (Kamalha et al, 2013; Norton et al, 2013; Rudd & Lennon, 2000; Tiggemann, 2012; Tsaousi & Brewis, 2013; Chattaraman & Rudd, 2006).

Women with lower body satisfaction are less satisfied with the fit of garment, generally. Self confidence, comfort and level of concealment are strongly related to perceived fit, sizing and size identity in clothing. Body confidence and body cathexis – satisfaction with the parts and the whole body – can be affected since a particular garment can made women feel better and more confident about their bodies, when the fit is good and hide the parts disliked of the body (Fan et al, 2004; Fan et al, 2007; Grogan et al, 2013). To Chattaraman & Rudd (2006), the lower are the body image, the greater has to be the clothing to covering better the body.

Comfort is also affected from wearers' attitudes, norms and beliefs. About the psychological aspect, comfort is affected by roles, values and social aspects of individuals, that addresses internal self-consciousness, value of life and how to satisfying oneself within available choices. In a more sociological approach, body image, personality, values or beliefs, personal interests and awareness among others interfere in comfort perception. Besides, garment attributes like style, texture, esthetics, fashion, suitability, design and color influences the comfort perception (Kamalha et al, 2013; Norton et al, 2013; Wages, 1974). It is important to maintain an affirmative self-image to perceived quality of life, as attractiveness has been viewed as a means to gain access to the power in a male world (Rudd & Lennon, 2000).

As comfort is not naturally attained, but is a result of evaluated com-

bination of the wearer – five senses, history and state; environment and clothing attributes. Fulfilling all the aspects of comfort is hard to achieve, so a better attempt has to be done to reach an optimal combined comfort perception. Furthermore, behaviors of individuals are contextual and depend on their comfort in diverse environments and social scenarios (Maldonado, 2011; Norton et al, 2013; Van der Linden, 2003, 2004; Vink, 2002, 2004; Vink et al 2004; Vink & Hallbeck, 2012).

Moreover, if fashion is a way to communicate identity, underwear choices reveals the deep of individuals' identity. Individuals perceive clothing as a way to establish and validate identity, as an expression of self-worth and an emotional response to self-evaluation and related to body image and body cathexis. The choice of lingerie reflects and stimulates diverse feelings depending on the occasion, forming the woman identity and becoming part of her identity expression. According to Paff Ogle et al (2014) findings, only the types of underwear that make women feel special are called lingerie. So, the consumer behavior of lingerie can be strongly related to identity and behavior of women, as underwear are used to construct and reconstruct various feminine identities, including professional, mother and sexual partner (Paff Ogle et al, 2014; Tsaosi & Brewis, 2013).

Tiggemann (2012) and Tsaosi & Brewis (2013) findings brought two concepts that can explain some women behaviors about panties usage. Respectively, bodywork and self-objectification. Bodywork is the way people transform their body from natural to cultural, according to society expectations, how individuals present themselves as acceptable subjects in everyday life. So, underwear has a huge importance to women appearance, since it is a base for outwear appearance and generate sensations of being in comfort in one's own skin, self-confidence and sex appeal. Even as self-objectification that occur when women and girls come to view themselves in objectified condition, as they internalize an observer's perspective. To Tiggemann, comfort is more related to how the body feels and the self-objectification is the opposite of it, when the appearance matters more in clothing (Tiggemann, 2012; Tsaosi & Brewis, 2013).

To Van der Linden (2004), the orientation that people have related to comfort should be considered, that could be related to pleasure – when the pleasure emotion increase comfort perception; or to integrity preservation – when comfort perception could be inhibited by perception of risk, decreasing also the perception of comfort and appearance. For the author, the behavior of use could be explained from the hedonic dimension and from four types of pleasure stated by Tiger (1992): physical, psychological, sociological and ideological. So, the use of panties that seems to be uncomfortable can be explained by the psychological pleasure, as the refuse to use the same model can be related to physical pleasure.

Also, discomfort can provoke a positive effect, because sometimes it is socially accepted to feel bad, so the individual begins certain behaviors

in the aim to feel the sensation that is supposed to feel (Cadilha, 2010). This idea justifies the behavioral of women that use comfortable panties only in some occasions, only when she was not with her boyfriend, as they declare in a previous study (Giongo, 2010), when they are supposed to be sexy, it is acceptable to feel uncomfortable intrinsically.

Panties comfort is a very important issue for apparel industry, as it affects customer satisfaction. Apparel industry is growing quickly in Brazilian market, and the sector of intimal apparel grew up 33% in the last 4 years. This sector has an important role in the whole fashion industry in Brazil, as it hire more than 180 thousand of people and is constituted by 3.3 thousand licensed enterprises (IEMI, 2015). A biannual research about the consumer behavior of various sectors shown that for the lingerie the majority of female consumers are young from 25 to 34 years old (30,6% of 1100 respondents) and constituted the social class C (62,1%). For the majority of respondents the principal requirement is comfort (70,8%), followed by practicality (related to basics; 25,3%) for everyday use. Nevertheless, lingerie also has to be sensual (22,7%) and romantic (11,2%) in same occasions. About the purchase motive, reasons related to emotion count 68,3% of the sample. According to the responsible for the research, lingerie has its prices and sales driven by level of enchantment they achieve with consumers (IEMI, 2015). Emotion has an important role in the understanding of panties preference, and emotion in products and design is an important field of research (Desmet, 2002, 2003; Desmet & Hekkert, 2002; Green & Jordan, 2004; Jordan, 2002).

Aiming to contribute to the development of design guidelines for Brazilian market, a research was developed, that addressed issues related to comfort perception, appearance evaluation and problems in use of panties (Giongo, 2012). In this research, comfort are considered as an affective state, multidimensional – only physical and psychological dimensions, which can be perceived by individuals between the completely uncomfortable to completely comfortable. As a basis for the construction of research instrument, the methods used were Van der Linden (2004) and Wages (1974).

In this paper a behavioral perspective of our results (Giongo, 2012) was presented, that concern to human factors field. It comprises an evaluation of factors involved in comfort perception of panties, according to different female behavioral profiles. The sample consisted of women, all of them undergraduate students, from two universities located in the south of Brazil, one private and one public, from diverse knowledge areas. Instead this research focused in young women (all of them are undergraduate students), it is supposed that comfort in clothing – and specially panties - is an important issue from tweens to older women, as there are some studies about them (Lee et al, 2012; Paff Ogle et al, 2013) and this research could be replicated to these age too.

2 Methods

2.1 Subjects

The population consisted in undergraduate women from two universities from metropolitan region of Porto Alegre/RS, located in the south region of Brazil. One private institution and one public were chosen, to equalize variables about socioeconomic aspects, to further enable diversity of personal orientations, due to diversity of knowledge areas of the courses offered. The research reached 347 respondents and most of the sample (94, 4%) is young, from 17 to 34 years.

2.2 Types of panties analyzed

In order to control some variables in the research, six models of panties were defined and nominated, based on best sellers in Brazilian market, to base some evaluations in the questionnaire applied to the sample.

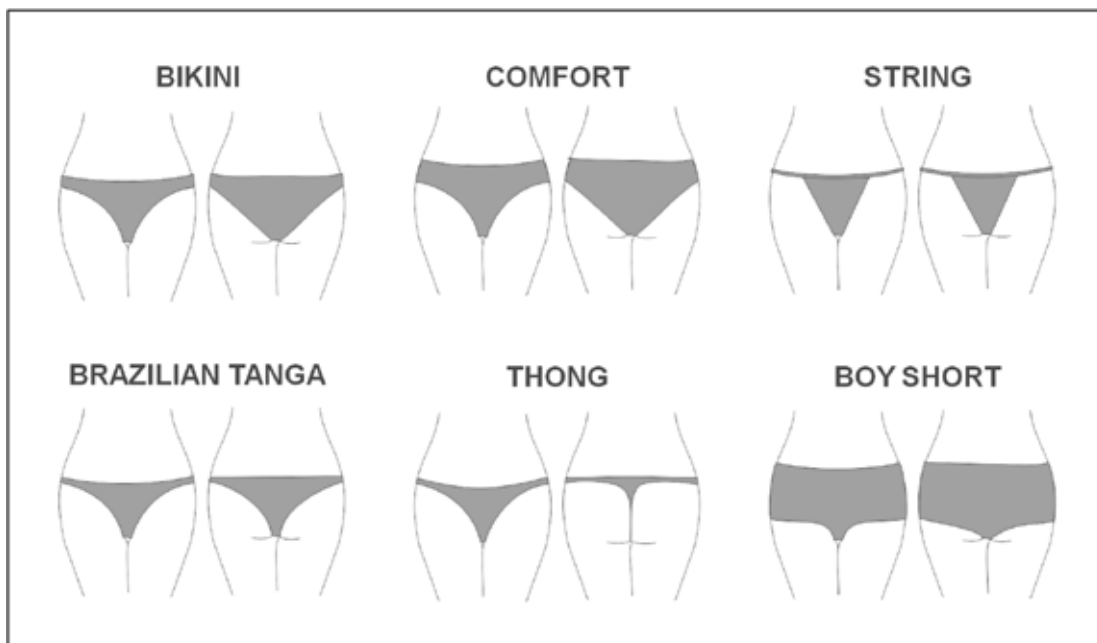


Figure 1 – models of panties analyzed

Source: from the authors

The six models were parameterized and modeled from basic panties pattern, according to the Brazilian panties characteristics:

- a) Bikini – 10cm below waistline, 4cm on the side, 2cm to 3cm on the back cuts;
- b) Comfort – 8cm below the waistline, 4cm to 6cm on the side, front cuts 2cm to 3cm more open than basic.
- c) String – stretch stripes on side or whole waistline of 2cm in

maximum, front and back patterns composed by triangles of 10cm to 15cm.

d) Brazilian *Tanga* – 10cm below waistline, 2cm to 3cm on sides, 3cm to 5cm on the back cuts

e) Thong – 3cm to 4cm crotch, 1cm to 4cm on the side, big open cut on back, forms a 1cm to 3cm strip on back.

f) Boyshort – 6cm to 8cm below the waistline, 6cm to 15cm on the side, cuts are downgraded.

Only the images of panties were shown to respondents, so they evaluated each panties by its silhouette. Variables like fabric, color, or other style elements are not considered.

2.3 Questionnaire

To assess the factors involved in panties comfort perception, a questionnaire, based on Perception of Comfort and Risk Model, proposed by Van der Linden (2004); on methodology developed by Wages (1974) to measure comfort in clothing and in a previous study of perception of comfort in panties (Giongo, 2010) were constructed. The questions about behavioral and psychological aspects are based on Van der Linden (2004) and Wages (1974).

Van der Linden (2004) proposed a classification for what he called dominant references, which is the search for pleasure – as the importance of appearance; and the escape of pain – as the preservation of the integrity. These orientations can be used to evaluate the behavioral profile of users, related to their relations to products usage, which can vary between optimist and pessimist. The author used some questions about concepts and behaviors, in enunciates with situations related to use of female shoes, which the respondents have to indicate their level of accordance. The responses can be used to classify the respondents in their orientation. Wages (1974) used a similar method, to identify behavioral profiles related to clothes, that she nominated extroverted and introverted, also secure and insecure. The author divided the comfort in three aspects: physical (1), related to hot, cold, looseness, firmness, in the use of clothes; psychosocial (2), related to wellness in social environments and workplaces; and psychological (3), related to mind stability. To her, some people emphasize the psychological aspect of comfort, while other emphasizes the physical aspect.

2.4 Statistical analysis

As the sample was a non-normal curve, to analyze the data, non-parametric statistical tests were applied, through the software Statistical Package for Social Science in its 18th version (SPSS18). First, the data was organized into variables and then were recoded them into numbers to

tabulate and analyze through frequency tables. As the answers for the questions were made by a Likert-type Scale, at first the values were submitted to a non-hierarchic K-means cluster analysis, a test that organizes the answers in groups by similarity to make a better analysis. Clusters analysis improves the homogeneity between variables into the clusters and improves the heterogeneity between the clusters.

At the second step, the Crosstabs with Pearson's Chi-square test was ran, to verify the correlation between the variables. The crosstab was chosen due to its ease of interpretation and clarity of the information presented, besides it helps to expose a complex phenomenon, better than a multivariate analysis. The Pearson's Chi-square was chosen to test the statistical significance between the answers of the sample.







3 RESULTS AND DISCUSSION

Results and discussion of each question, and analysis between variables are presented in this section.

3.1 The use of panties

The question regarding the use of panties addressed the frequency that participants use each type of panties. The results were tabulated and the frequencies of responses were presented in the Table 1. To this sample, the models most used (frequently; daily) are bikini (A) and tanga (D). The models less used (rarely; never) are thong (E) and boy short (F).

Table 1- Sample frequency of panties' usage

		FREQUENCY OF USE				
		never	rarely	eventually	frequently	daily
A	BIKINI 	N 43 % 12,4	44 12,7	54 15,6	108 31,1	93 26,8
B	COMFORT 	N 98 % 28,2	54 15,6	53 15,3	72 20,7	65 18,7
C	STRING 	N 85 % 24,5	52 15,0	62 17,9	85 24,5	58 16,7
D	BRAZILIAN TANGA 	N 28 % 8,1	42 12,1	65 18,7	122 35,2	82 23,6
E	THONG 	N 144 % 41,5	52 15,0	35 10,1	68 19,6	44 12,7
F	BOYSHORT 	N 203 % 58,5	72 20,7	33 9,5	25 7,2	10 2,9

Source: authors

Cluster analysis of frequency of use lead to a 3 clusters solution . The decision for this solution was made because it generated groups with better sample distribution and also better analysis possibility. Based on these groups, 3 profiles of the panties usage were established, shown in the Table 2.

Table 2 – Groups by panties usage profile

	BIKINI	COMFORT	STRING	BRAZILIAN TANGA	THONG	BOYSHORT
DARING	2	1	3	4	4	1
MODERATE	4	3	3	4	2	2
CONSERVATIVE	4	4	2	3	1	2

1=never 2=rarely 3=eventually 4=frequently 5=daily

Source: authors

The first group was nominated as 'daring', because the most frequently used models are 'Brazilian tanga' and 'thong', the smallest ones, while the less used are the biggest ones, 'comfort' and 'boyshort'. The second group was nominated as 'moderate' considering that the most used models 'bikini and 'Brazilian tanga' are, the middle in terms of concealment and sensuality and these models are in. Finally, the third group was called 'conservative' because the individuals tend to never use the 'thong', the sexiest one, and use frequently the models 'bikini' and 'comfort'.

3.2 Behavioral profile

To identify what are defined as the behavioral profile, a question that presents phrases related to use of panties was developed. The level of agreement with each phrase indicated an inclination to one behavior. The responses were submitted to a cluster analysis, forming three groups: introverted, contextual and extroverted. These groups have been nominated based on Wages (1974) and Van der Linden (2004). Table 3 shows the responses that most differentiate and lead the groups' designation. The introverted woman is the most concerned with herself, her integrity; the contextual profile is the woman that are conditioned to a situation, a context of use; while the extroverted women are the group that are turn to others, to society.

	Introverted	Contextual	Extroverted
If a panties is very attractive to me, but causes physic discomfort, I use it even so	-- STRONGLY DISAGREE	- DISAGREE	
I give up comfort to feel more beautiful and sexy	- DISAGREE	- DISAGREE	
It is important to me to use clothes, include panties, that are fashionable	- DISAGREE	- DISAGREE	
It is important to me that my clothes, include my panties, create good impression to other people			+ AGREE
In special occasions, i give up comfort to use a beautiful and sexy panties.	- DISAGREE	+ AGREE	+ AGREE
It is more important that a pantie is suitable to my body type, than it be beautiful or sexy	+ AGREE	+ AGREE	
I prefer a comfortable panties, even if not sexy	+ AGREE	+ AGREE	
I like discrete panties, that are inconspicuous.	+ AGREE		- DISAGREE
I feel constrained with a sensual panties.		- DISAGREE	- DISAGREE

Table 3 – Behavioral profile of sample: introverted; extroverted; contextual.

Source: authors

For the introverted profile, the reference was the phrase 'If panties are very attractive to me, but causes physic discomfort, I use it even so', that received the answer 'strongly disagree'. As well as agree with the phrase 'I like discrete panties, that are inconspicuous'. These women concern more about themselves than others, they care about their integrity and do not mind so much with society.







The profile of extroverted women answered that agree with the phrases 'It is important to me that my clothes, include my panties, create good impression to other people' and 'In special occasions, I give up comfort to use a beautiful and sexy panties'. Even as they disagree with the phrases 'I like discrete panties that are inconspicuous.' and 'I feel constrained with a sensual panties'. These responses indicate a strong pursuit of pleasure and concern for others.

The women in the middle group were nominated contextual, because their behavioral seems to be leaded by the situation. They disagree with 'I feel constrained with a sensual panties', whereas agree that 'In special occasions, I give up comfort to use a beautiful and sexy panties'.

3.3 Comfort Perception

Based on the silhouette of the panties studied and beyond the authors researched, the research consider that panties that cover the body anatomically is more balanced between physical and psychological dimensions of comfort that another that cover too little or too much. So, in this question the perception of comfort of respondents was investigated.







Table 4 – Sample frequency to comfort perception in use

		Comfort in use				
		Very uncomfortable	uncomfortable	Indiferent	comfortable	Very comfortable
BIKINI	N	15	19	53	140	115
	%	4,3	5,5	15,3	40,3	33,1
COMFORT	N	12	39	67	118	102
	%	3,5	11,2	19,3	34,0	29,4
STRING	N	37	92	71	102	38
	%	10,7	26,5	20,5	29,4	11,0
BRAZILIAN TANGA	N	13	41	82	133	71
	%	3,7	11,8	23,6	38,3	20,5
THONG	N	120	96	45	52	26
	%	34,6	27,7	13,0	15,0	7,5
BOYSHORT	N	59	70	67	60	80
	%	17,0	20,2	19,3	17,3	23,1

Source: authors

Through the frequency of responses, it is possible to verify that the models 'bikini', 'comfort' and 'Brazilian tanga' were mostly perceived as comfortable, while the model 'thong' was mainly perceived as uncomfortable, which reinforced our assumption. The responses were submitted to a cluster analysis and the 3 clusters solution was chosen, designated as 'psychological comfort (pleasure)'; 'physical and psychological comfort' and 'physical comfort', according to our understanding of what comfort dimension could be predominant to each cluster.

Table 5 – Groups by comfort perception

	BIQUINI	COMFORTO	STRING	TANGA	FIO-DENTAL	CALEÇON
						
Psychological comfort (pleasure)	2	2	3	3	4	3
Physical and psychological comfort	4	3	4	4	3	2
Physical comfort	4	4	2	3	2	4




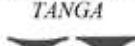


1= Very uncomfortable 2= uncomfortable 3=indiferent 4= comfortable 5= Very comfortable

Then, the group 'psychological comfort (pleasure)' is the one which has the comfort perception affected mainly by psychological dimension, pursuit of pleasure, which justifies the response 'comfortable' to model 'thong' while 'bikini' and 'comfort' are marked as 'uncomfortable'. The group nominated 'physical and psychological comfort' cover the women that answered 'comfortable' to models 'bikini', 'string', and 'Brazilian tanga', which are in the middle of coverage and sensuality, which indicates that these women combine these two dimensions of comfort, with a leaning to social dimension of comfort proposed by Wages (1974). Finally, the cluster that responded 'comfortable' to models 'bikini', 'comfort' and 'boyshort' were called 'physical comfort', since these models have a good concealment, which indicates an inclination to physical dimension of comfort.

3.4 Appearance evaluation

This question addresses an evaluation of appearance of the panties. The participants had to answer the level of pleasure of each panties presented, as shown in Table 6. The most pleasant models are 'bikini', 'string' and 'Brazilian tanga'. To the sample, the most unpleasant model is the 'boyshort'.

Table 6 – Sample frequency to appearance evaluation of panties

		APPEARANCE OF PANTIES				
		Very unpleasant	unpleasant	Indifferent	pleasant	Very pleasant
BIKINI	N	11	44	95	145	49
	%	3,2	12,7	27,4	41,8	14,1
COMFORT	N	19	93	108	98	23
	%	5,5	26,8	31,1	28,2	6,6
STRING	N	21	51	73	141	56
	%	6,1	14,7	21,0	40,6	16,1
BRAZILIAN TANGA	N	6	15	50	194	70
	%	1,7	4,3	14,4	55,9	20,2
THONG	N	62	61	51	95	72
	%	17,9	17,6	14,7	27,4	20,7
BOYSHORT	N	136	107	49	39	14
	%	39,2	30,8	14,1	11,2	4,0

Source: authors

To this question, a cluster analysis was made and divided into 3 groups, as shown in Table 7. As the prominent responses are the 'unpleasant', the groups were designated by their rejection to each model of panties.

Figura 1: Sistematização do método utilizado.

Table 7 – Groups by appearance evaluation

	BIQUINI	CONFORTO	STRING	TANGA	FIO-DENTAL	CALEÇON
REJECT LARGEST	3	2	4	4	4	2
REJECT FARTHEST	4	4	4	4	2	2
REJECT SMALLEST	4	4	2	3	2	3

1= Very unpleasant 2= unpleasant 3=indifferent 4=pleasant 5= Very pleasant

Source: authors

The first group was called ‘reject the largest’, as they answer ‘unpleasant’ to appearance of models ‘comfort’ and ‘boyshort’, that most cover the body. The cluster ‘reject farthest’ evaluate the appearance of models ‘thong’ and ‘boyshort’ as unpleasant, which are respectively the smallest and the largest one, and are supposed to be more balanced. Lastly, the group named ‘reject smallest’ classified the appearance of models ‘string’ and ‘thong’ as unpleasant, what are the models that most reveal the body.

3.5 Dimension of comfort

This question investigated the responses to some comfort descriptors elicited in a previous survey applied in the main research (Giongo, 2012). Participants were asked to respond about the level of improvement of comfort or discomfort to each descriptor. The sample frequency is shown in Table 8.

Table 8 – Sample frequency to answers to dimension of comfort

Wear panties...	greatly increases discomfort	increases discomfort	indifferent	increases comfort	greatly increases comfort	Total
that fits to the body	1	4	20	168	145	338
beautiful	0	3	171	122	37	333
with details (panels, laces, applications, color mixing, ...)	14	93	179	40	13	339
with elastic bands	24	120	107	70	15	336
with narrow side	49	144	71	49	19	332
with wide side	14	50	87	150	38	339
with few seams	2	6	51	162	117	338
high waist	26	90	96	94	26	332
low waist	31	119	117	62	11	340
of lace	25	100	159	43	8	335
of hypoallergenic fabric	0	3	121	141	69	334
of stretch fabric	5	30	97	160	41	333
of firm fabric	11	69	100	122	34	336
of lightweight fabric	2	9	50	187	91	339
of soft fabric	1	2	24	195	116	338
of natural fabric (cotton, rayon, ...)	3	3	52	162	115	335
of synthetic fabric (microfiber, nylon, lycra, ...)	17	86	118	86	33	340

of breathable fabric	1	4	83	162	86	336
delicate	1	12	146	119	59	337
printed	6	8	273	34	13	334
big	42	108	119	60	9	338
plain	4	4	228	74	24	334
small	53	137	87	45	12	334
that tightens	203	112	15	7	2	339
that covers the buttocks	57	98	102	67	14	338
which marks under clothing	161	146	25	4	0	336
which marks the body	162	133	23	15	2	335
that models the body	11	21	79	154	71	336
seamless	0	2	57	163	113	335
sensual	9	31	171	82	40	333
cut out at the buttocks	66	99	74	60	33	332
that I do not realize that I am using	2	8	36	99	196	341

Source: authors

In this question only 2 groups were possible to made, because of the homogeneity of the clusters size, as shown in Table 9, which shows the descriptors separately according to the comfort or discomfort.

Table 9 – Clusters by dimension of comfort

Wear panties...	Group 1 - values psychological comfort	Group 2 - values physical comfort
with details (panels, laces, applications, color mixing, ...)	3	3
with elastic bands	3	3
with narrow side	3	2
high waist	3	3
low waist	3	2
of lace	3	3
D synthetic fabric (microfiber, nylon, lycra, ...)	3	3
small	3	2
that tightens	1	1
which marks under clothing	1	2
which marks the body	2	2
cut out at the buttocks	4	2
that fits to the body	5	4
beautiful	4	3
with wide side	3	4
with few seams	4	4
of hypoallergenic fabric	4	4
of stretch fabric	4	4
of firm fabric	3	3
of lightweight fabric	4	4
of soft fabric	4	4
C of natural fabric (cotton, rayon, ...)	4	4
of breathable fabric	4	4
delicate	4	3
printed	3	3
big	2	3
plain	3	3
that covers the buttocks	2	3
that models the body	4	4
seamless	4	4
sensual	4	3
that I do not realize that I am using	4	4

1= greatly increases discomfort 2= increases discomfort 3=indifferent 4= increases comfort 5= greatly increases comfort
C=comfort descriptors D=discomfort descriptors

Source: authors

The first cluster was designated as 'values psychological comfort', because of the positive responses – 'increases comfort' – to the discomfort descriptor 'cut out at the buttocks', as well as negative responses – 'increases discomfort' to the comfort descriptors 'big' and 'that covers the buttocks'. The positive responses to 'beautiful', 'delicate' and 'sensual' indicated a behavioral and a comfort perception mainly psychological, linked to value of appearance and pursuit of pleasure.

The second cluster was nominated as 'values physical comfort' due to the negative responses – increases discomfort – to the discomfort descriptors 'with narrow side', 'low waist', 'small' and 'cut out at the buttocks'. This group tends to be motivated by physical comfort, which is confirmed with the positive response – 'increases comfort' – to the comfort descriptor 'with wide side'.

3.6 Cross tabulation between clusters

To better understand the motivation of use of panties, some cross tabulation were performed between the clusters found at the first step of the analysis. This procedure also helped to enhance the reliability of data founded. Pearson's Chi-square tests were performed in cross tabs between use profile and the other variables: behavioral profile, comfort perception, appearance evaluation, and dimension of comfort.

The crossing between usage profile and behavioral profile had three significant associations: daring women tend to be extroverted; moderate women tend to be contextual and conservative women tend to be introverted.

Table 12 – cross tabulation to usage profile x behavioral profile

Usage profile		Behavioral profile		
		introverted	contextual	extroverted
daring	Count	12	18	64
	Expected count	22,2	39,9	31,9
	Adjusted residual	-3,0	-5,6	8,5
moderate	Count	22	63	30
	Expected count	27,2	48,8	39,0
	Adjusted residual	-1,5	3,4	-2,3
conservative	Count	35	43	5
	Expected count	19,6	35,2	28,1
	Adjusted residual	4,7	2,0	-6,3
Total	Count	69	124	99
	Expected count	69,0	124,0	99,0

Source: authors

The crossing between usage profile and comfort perception clusters had also three significant associations: daring women tend to perceive comfort through psychological dimension; moderate women tend to perceive comfort through physical and psychological dimension and conservative women tend to perceive comfort through physical dimension.

Table 10 - cross tabulation to usage profile x comfort perception clusters

Usage profile		Comfort perception clusters		
		physical comfort	physical and psychological comfort	psychological comfort (pleasure)
daring	Count	17	50	37
	Expected count	50,5	38,8	14,7
	Adjusted residual	-4,7	1,8	5,8
moderate	Count	57	65	6
	Expected count	62,2	47,7	18,1
	Adjusted residual	-,7	2,5	-2,8
conservative	Count	81	4	2
	Expected count	42,3	32,5	12,3
	Adjusted residual	6,0	-5,0	-2,9
Total	Count	155	119	45
	Expected count	155,0	119,0	45,0

Source: authors

The cross tabulations between usage profile and appearance evaluation clusters generated three significant associations too: daring women tend to reject largest panties; moderate women tend to reject farthest from standard panties and conservative women tend to reject smallest panties.

Table 11 - cross tabulation to usage profile x appearance evaluation clusters

Usage profile		Appearance evaluation clusters		
		reject smallest	reject farthest from standard	reject largest
daring	Count	5	17	86
	Expected count	20,6	43,5	43,9
	Adjusted residual	-3,4	-4,0	6,4
moderate	Count	14	72	41
	Expected count	24,2	51,2	51,6
	Adjusted residual	-2,1	2,9	-1,5
conservative	Count	42	40	3
	Expected count	16,2	34,3	34,5
	Adjusted residual	6,4	1,0	-5,4
Total	Count	61	129	130
	Expected count	61,0	129,0	130,0

Source: authors

The last cross tabulation was between usage profile and dimension of comfort clusters and generated only two significant associations: daring women tend to value psychological comfort and conservative women tend to value physical comfort.

Table 13 - cross tabulation to usage profile x dimension of comfort clusters

Usage profile		Dimension of comfort clusters	
		values psychological comfort	values physical comfort
daring	Count	56	24
	Expected count	31,6	48,4
	Adjusted residual	6,8	-6,8
moderate	Count	33	67
	Expected count	39,5	60,5
	Adjusted residual	-1,7	1,7
conservative	Count	9	59
	Expected count	26,9	41,1
	Adjusted residual	-5,2	5,2
Total	Count	98	150
	Expected count	98,0	150,0

Source: authors

Significant associations between clusters corroborate with the assumption that dominant references are related to the profile of use, in other words, in the choice of panties. The Figure 2 shows all the relations between usage profile and other variables.

Usage Profile	Behavioral Profile	Comfort Perception	Appearance Evaluation	Dimension of comfort
DARING	Extroverted	Psychological comfort (pleasure)	Reject largest	Values psychological comfort
MODERATE	Contextual	Physical and psychological comfort	Reject farthest	-
CONSERVATIVE	Introverted	Physical comfort	Reject smallest	Values physical comfort

Figure 2 – Significant associations between the clusters
Source: authors

It is clear with these findings that women have different behavior against panties choice and usage, which is coherent with their perception of comfort, lead to their inclination to a dimension of comfort and their evaluation of panties appearance. All these interactions reflect on the panties usage and depend on their background, their behavior towards society, their concern with others and their dominant reference to pursuit of pleasure or preservation of integrity.

So, the main results are that introverted women tend to value comfort as the physical dimension, be conservative and care less with their appearance than their well-being. Extroverted women tend to value comfort in its psychological dimension, or pursuit of pleasure. They are daring and value their appearance more than their well-being.

4 Conclusions

It is well known that women have different profiles and literature has shown that this background could influence the perception of comfort and consequently the

choice related to products. The assumption that these variables would influence the panties usage was validated by the significant associations between the variables, and this validation through statistical analysis is very important and necessary to systematize the understanding about women behavior in panties choice and use.

For the three usage profiles identified in our research, was found a coherent choice of panties related to comfort and appearance. In each cluster women use to use more frequently the models of panties which they perceive as comfortable and pleasant, and use less frequently the models of panties they perceive as uncomfortable and unpleasant.

The daring woman is extroverted, characterized by the pursuit of pleasure. She values psychological comfort and uses more frequently the models 'Brazilian tanga' and 'thong', which considers pleasant in the appearance, besides perceives the model 'thong' as comfortable. The model 'string' is used eventually and also considered pleasant. On the contrary, the models 'bikini', 'comfort' and 'boyshort', which are considering uncomfortable and unpleasant are used rarely or never.

The moderate woman is contextual, perceives comfort as both psychological and physics dimensions and uses more frequently the models 'bikini' and 'Brazilian tanga', which are perceived as comfortable and evaluated as pleasant, as the models 'comfort' and 'string', which they use eventually. Otherwise, the models rarely used are perceived as uncomfortable and evaluated as unpleasant appearance.

The conservative woman is introverted, characterized by the concern about herself. She values physical dimension of comfort and frequently uses models 'bikini' and 'comfort', which are perceived as comfortable and evaluated as pleasant. The model 'string' is perceived as uncomfortable and evaluated as unpleasant is rarely used by this woman. The model 'thong' is never used by this woman, perceived as uncomfortable and evaluated as unpleasant.

This paper presented an analysis based on the usage profile as a center of the analysis as a dependent variable, by means of a behavioral approach. As a suggestion, another kind of analysis could be made, in the aim to understanding how appearance evaluation and comfort perception are influenced by behavioral profile. In this paper, were not approached the physical characteristics of the sample, which can contribute a lot for the understanding of panties usage. Also, as a suggestion, a further research could be made with different characteristics of sample in this paper, such as another age group, or another region. A comparison study between Brazilian and foreign women would also be interesting.

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